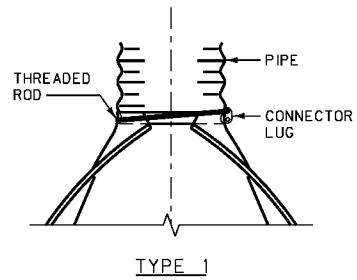
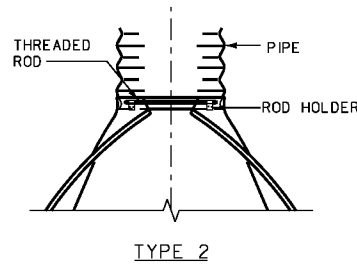


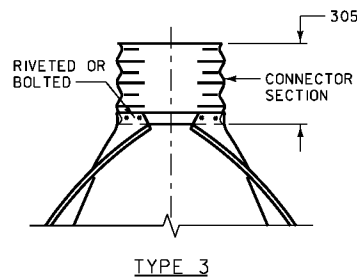
CONNECTIONS



TYPE 1

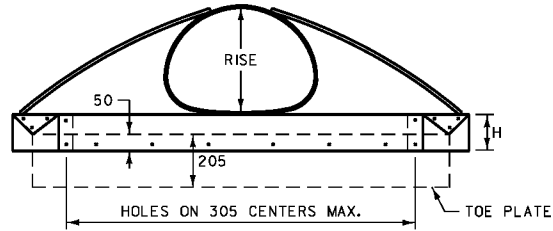


TYPE 2

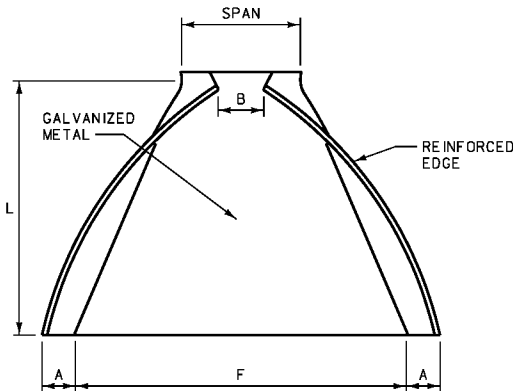


TYPE 3

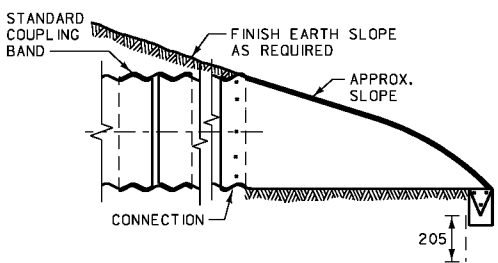
ARCH PIPE



ELEVATION

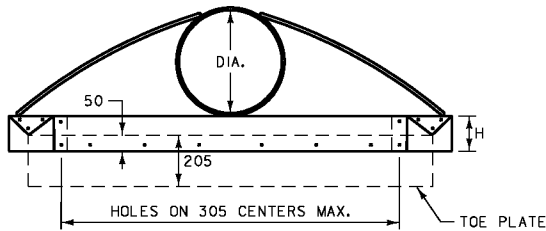


PLAN

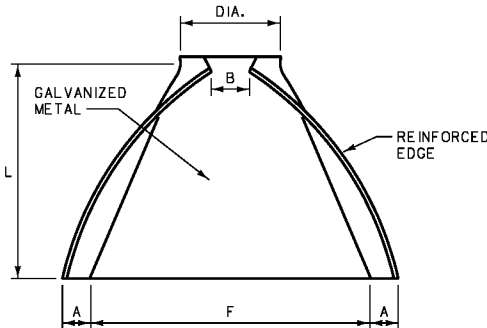


TYPICAL CROSS-SECTION  
(ILLUSTRATED WITH TYPE 3 CONNECTION)

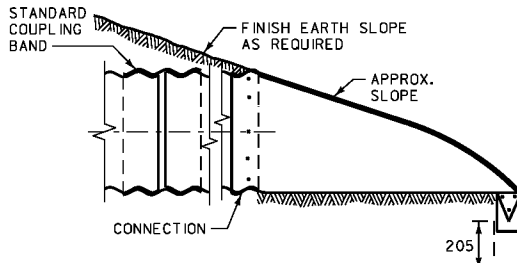
ROUND PIPE



ELEVATION



PLAN



TYPICAL CROSS-SECTION  
(ILLUSTRATED WITH TYPE 3 CONNECTION)

NOTES:

PROVIDE TOE PLATE WHEN SPECIFIED.

GALVANIZE ALL PARTS IN ACCORDANCE WITH AASHTO M 36M.

PAINT ANY AREAS WHERE GALVANIZING IS BROKEN OR METAL IS BARE WITH ONE COAT OF ZINC CHROMATE PRIME AND TWO COATS OF ALUMINUM PAINT.

MINOR VARIATIONS IN DESIGN MAY BE ACCEPTABLE ON APPROVAL OF THE ENGINEER.

SEAMS OR JOINTS LENGTHWISE OF THE APRON ARE ACCEPTABLE IF SECURELY BOLTED OR WELDED AND PAINTED AS PROVIDED ABOVE.

SPAN × RISE	MINIMUM THICKNESS *	DIMENSIONS					APPROX. SLOPE	TYPE CONNECTOR
		A 25 TOL.	B MAX.	H 25 TOL.	L 40 TOL.	F 50 TOL.		
68 × 13 CORRUGATIONS								
430 × 330	1.63	130	230	150	510	710	2.13: 1	2
530 × 380	1.63	150	280	150	610	860	2: 1	2
610 × 460	1.63	180	300	150	710	1020	2.13: 1	2
710 × 510	1.63	180	410	150	810	1170	2: 1	2
885 × 610	2.01	230	410	150	990	1470	1.88: 1	2
1060 × 740	2.01	280	460	180	1170	1850	1.88: 1	3
1240 × 840	2.77	300	530	230	1350	2080	1.75: 1	3
1440 × 970	2.77	410	660	300	1570	2240	1.88: 1	3
1620 × 1100	2.77	430	760	300	1750	2540	1.88: 1	3
1800 × 1200	2.77	430	910	300	1960	2840	1.88: 1	3
1950 × 1320	2.77	430	910	300	1960	3150	1.63: 1	3
2100 × 1450	2.77	430	1120	300	1960	3300	1.5: 1	3
75 × 25 CORRUGATIONS								
1340 × 1050	2.77	430	660	300	1600	2240	1.75: 1	3
1520 × 1170	2.77	430	910	300	1780	2540	1.88: 1	3
1670 × 1300	2.77	430	910	300	1960	2840	1.75: 1	3
1850 × 1400	2.77	430	910	300	1960	3150	1.5: 1	3
2050 × 1500	2.77	430	1120	300	1960	3450	1.63: 1	3

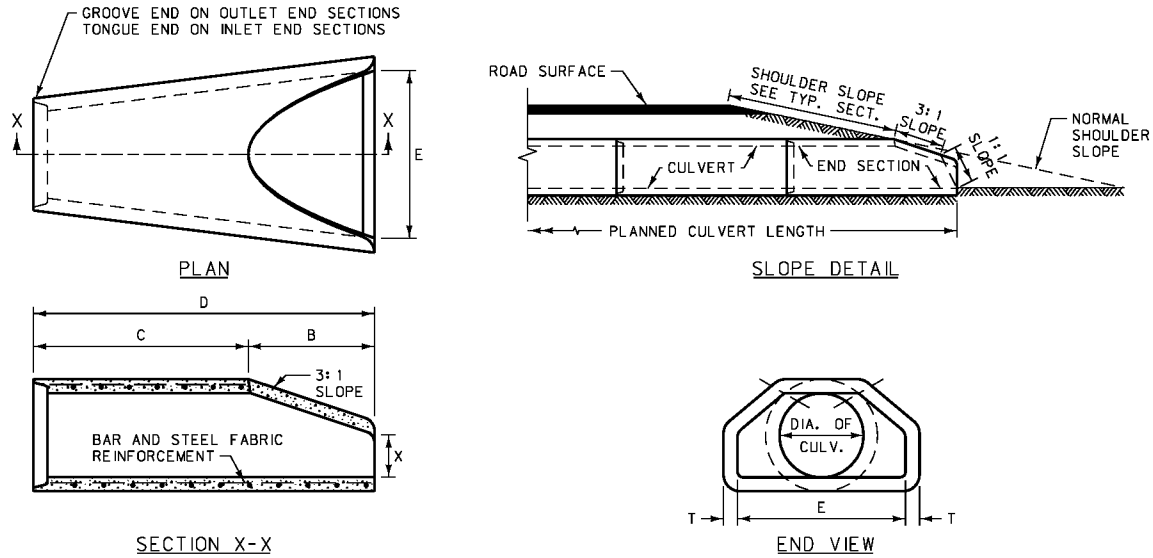
PIPE DIA.	MINIMUM THICKNESS *	DIMENSIONS					APPROX. SLOPE	TYPE CONNECTOR
		A 25 TOL.	B MAX.	H 25 TOL.	L 40 TOL.	F 50 TOL.		
300	1.63	125	180	150	535	560	2.25: 1	1
375	1.63	150	205	150	660	710	2.25: 1	1
450	1.63	180	255	150	785	865	2.13: 1	1
525	1.63	205	305	150	915	1015	2.13: 1	1
600	1.63	230	330	150	1040	1170	2.13: 1	1
750	2.01	280	405	205	1295	1395	2.13: 1	2
900	2.01	330	485	230	1525	1780	2: 1	2
1050	2.77	380	635	255	1755	2085	2.13: 1	3
1200	2.77	430	735	305	1980	2235	2: 1	3
1350	2.77	430	840	305	2135	2540	2: 1	3
1500	2.77	430	915	305	2210	2845	1.88: 1	3
1650	2.77	430	990	305	2210	2995	1.63: 1	3
1800	2.77	430	1120	305	2210	3050	1.5: 1	3
1950	2.77	430	1220	305	2210	3300	1.38: 1	3
2100	2.77	430	1320	305	2210	3455	1.33: 1	3

\* THICKNESSES SHOWN ARE FOR STEEL CULVERTS.  
FOR THICKNESS OF ALUMINUM, SUBTRACT 0.10 mm.

ALL DIMENSIONS ARE MILLIMETERS  
(mm) UNLESS OTHERWISE NOTED.

DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	603-02
SECTION 603, 709	
CMP FLARED END TERMINAL SECTION (FETS)	
EFFECTIVE: AUGUST 1999	
	MONTANA CADD

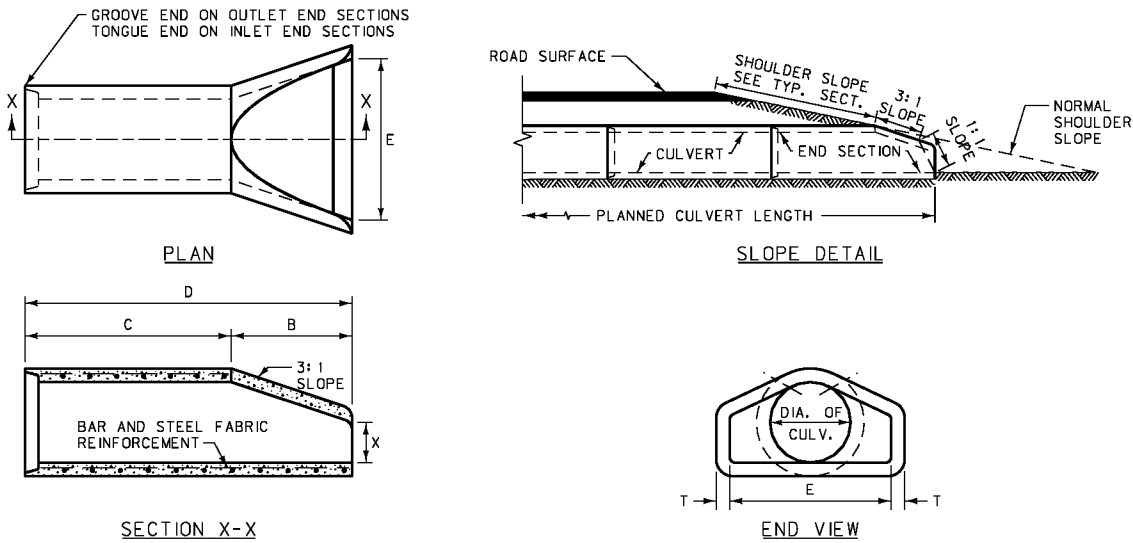
TYPE "A"



TYPE "A"						
DIA.	X	B	C	D	E	T *
300	101.6	609.6	1228.7	1838.3	609.6	50.8
375	152.4	685.8	1168.4	1854.2	762.0	57.2
450	228.6	685.8	1168.4	1854.2	914.4	63.5
600	241.3	1104.9	762.0	1866.9	1219.2	76.2
750	304.8	1371.6	501.7	1873.3	1524.0	88.9
900	381.0	1600.2	882.7	2482.9	1828.8	101.6
1050	533.4	1600.2	889.0	2489.2	1981.2	114.3
1200	609.6	1828.8	660.4	2489.2	2209.8	127.0
1350	685.8	1651.0	889.0	2540.0	2286.0	139.7

\* WALL "B" THICKNESS

TYPE "B"

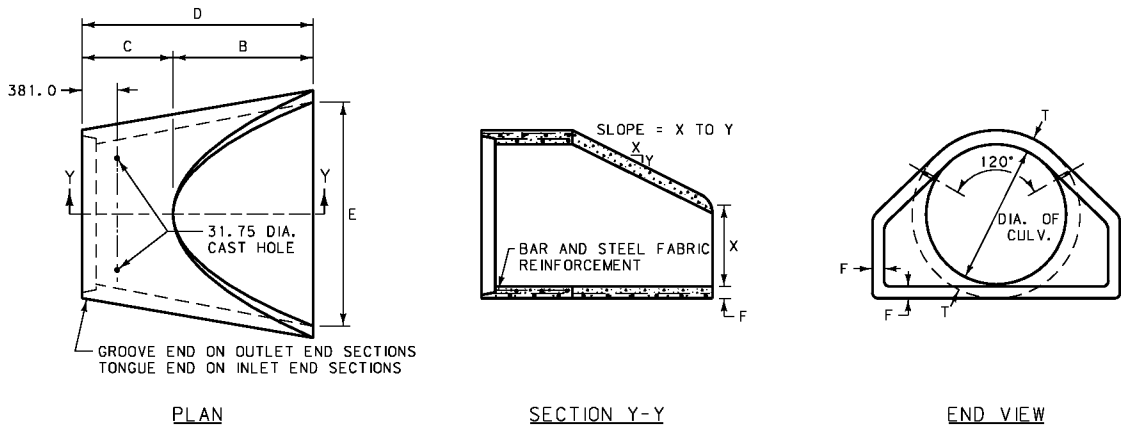


TYPE "B"						
DIA.	X	B	C	D	E	T *
300	101.6	609.6	1241.4	1851.0	609.6	50.8
375	152.4	685.8	1168.4	1854.2	762.0	57.2
450	228.6	685.8	1168.4	1854.2	914.4	63.5
600	241.3	1104.9	762.0	1866.9	1219.2	76.2
750	304.8	1371.6	501.7	1873.3	1524.0	88.9
900	381.0	1600.2	882.7	2482.9	1828.8	101.6
1050	533.4	1600.2	889.0	2489.2	1981.2	114.3
1200	609.6	1828.8	660.4	2489.2	2133.6	127.0
1350	685.8	1651.0	844.6	2495.6	2286.0	139.7

\* WALL "B" THICKNESS

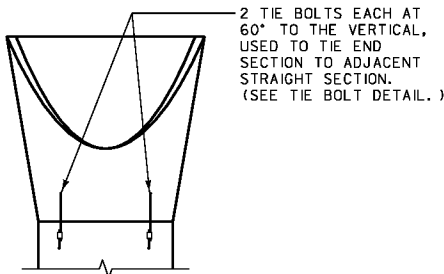
TOLERANCES IN THE ADJACENT TABLES MAY NOT VARY MORE THAN ±1.5% FOR THE DIMENSIONS SHOWN. OTHERWISE THEY MUST CONFORM TO AASHTO M 170M.

LARGE DIAMETER PIPE



LARGE DIAMETER CULVERT							
DIA.	SLOPE	T *	X	B	C	D	E
1500	2:1	152.4	889.0	1524.0	990.6	2514.6	2438.4
1800	1.86:1	177.8	914.4	1981.2	533.4	2514.6	2743.2
2100	1.5:1	203.2	914.4	2298.7	533.4	2832.1	3048.0

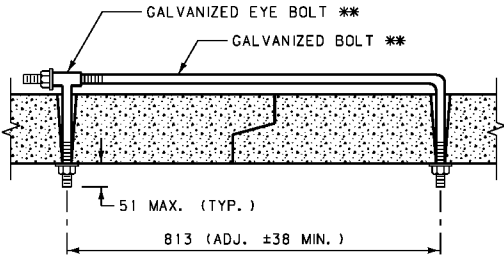
\* WALL "B" THICKNESS



TIE BOLT CONNECTION

TIE BOLTS: USE TWO TIE BOLTS ON ALL FLARED END SECTIONS, ONE ON EACH SIDE AT 60° TO THE VERTICAL. GALVANIZE ALL PARTS. SEE TIE BOLT DETAIL.

CONSTRUCTION: CONSTRUCT ACCORDING TO CLASS III, AASHTO M 170M, AS FAR AS DESIGN WILL PERMIT.

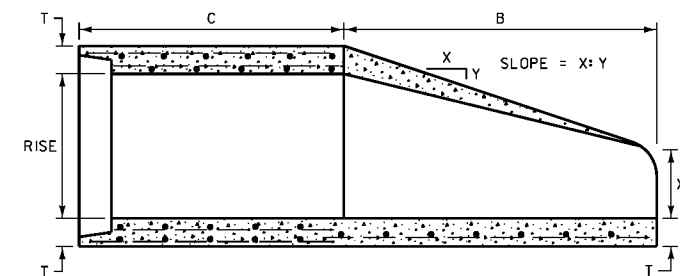


\*\* M20 FOR 300 TO 1350 DIA. RCP  
M24 FOR 1500 TO 2100 DIA. RCP

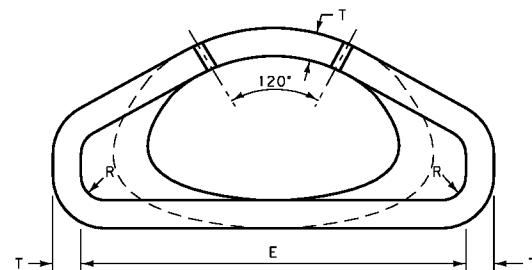
TIE BOLT DETAIL  
(TWO PER END SECTION)

ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

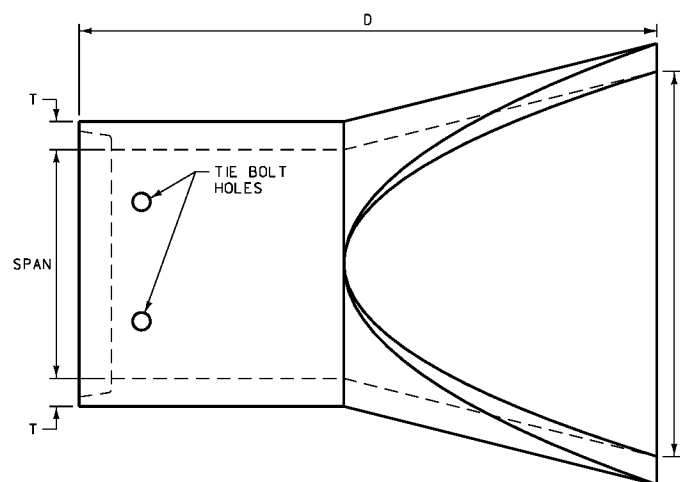
DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	603-08
SECTION 603, 708	
PREFABRICATED RCP FLARED END TERMINAL SECTION (FETS)	
EFFECTIVE: AUGUST 1999	
	MONTANA CADD



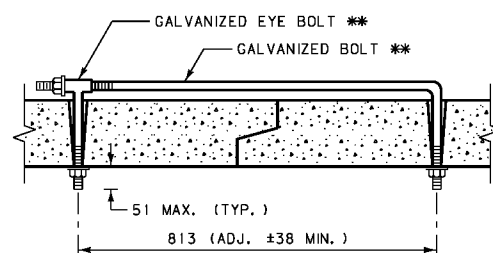
LONGITUDINAL SECTION



END VIEW



PLAN VIEW



\*\* M20 FOR 560 x 345 TO 1650 x 1015 RCPA

M24 FOR 1855 x 1145 TO 2235 x 1370 RCPA

TIE BOLT DETAIL  
(TWO PER END SECTION)

TIE BOLTS: USE TIE BOLTS ON ALL FLARED END SECTIONS, ONE ON EACH SIDE AT 60° TO THE VERTICAL. GALVANIZE ALL PARTS. SEE TIE BOLT DETAIL.

CONSTRUCTION: CONSTRUCT ACCORDING TO CLASS A-III, AASHTO M 206M, AS FAR AS DESIGN WILL PERMIT.

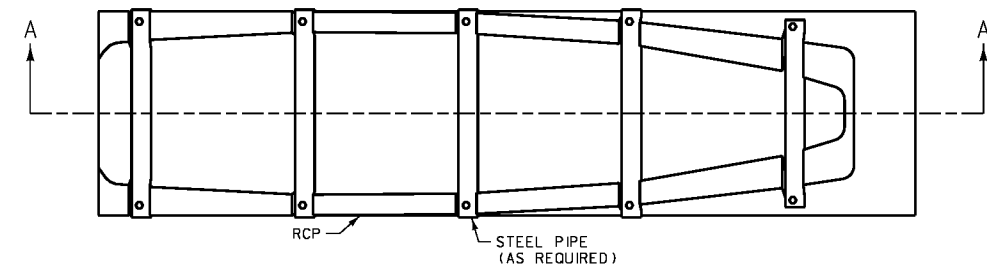
SPAN	RISE	T *	X	B	C	D	E	R	SLOPE
560	345	63.5	215.9	1143.0	685.8	1828.8	914.4	76.2	3:1
725	460	76.2	215.9	990.6	838.2	1828.8	1219.2	76.2	3:1
920	570	88.9	241.3	1270.0	1168.4	2438.4	1524.0	76.2	3:1
1110	675	101.6	282.6	1524.0	914.4	2438.4	1828.8	152.4	3:1
1300	795	114.3	401.6	1524.0	914.4	2438.4	1981.2	152.4	3:1
1485	915	127.0	533.4	1524.0	914.4	2438.4	2133.6	152.4	3:1
1650	1015	139.7	647.7	1524.0	914.4	2438.4	2286.0	152.4	3:1
1855	1145	152.4	787.4	1524.0	914.4	2438.4	2438.4	152.4	3:1
2235	1370	177.8	787.4	1524.0	990.6	2514.6	3048.0	152.4	2:1

\* WALL "B" THICKNESS

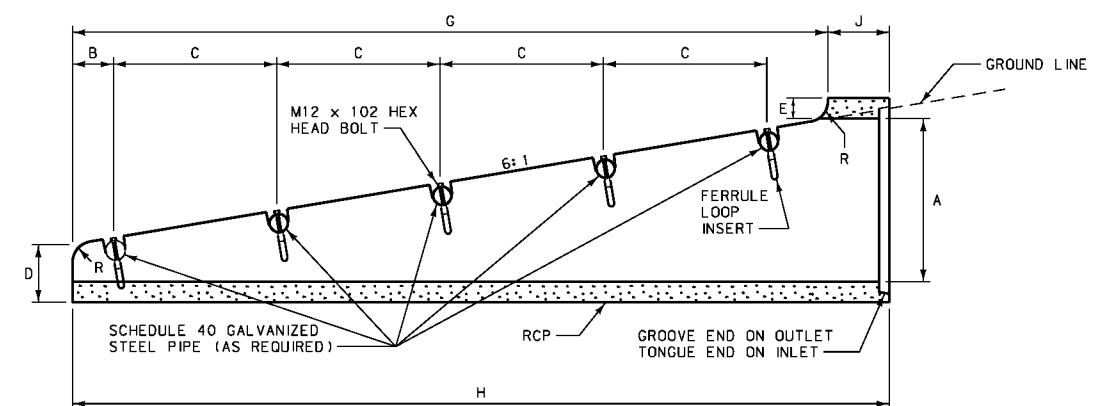
ALL DIMENSIONS ARE MILLIMETERS  
(mm) UNLESS OTHERWISE NOTED.

DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	603-10
SECTION 603	
PREFABRICATED RCP ARCH FLARED END TERMINAL SECTION (FETS)	
EFFECTIVE: AUGUST 1999	

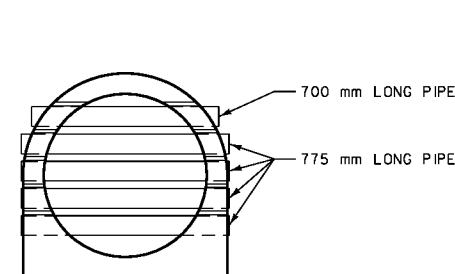
ROAD APPROACH CULVERT END TREATMENT										
QUANTITIES (FOR ESTIMATING ONLY)										
DIA. A RCP	H PIPE LENGTH	M12 x 105 FERRULE LOOP INSERT, EACH	LENGTH 63 DIA. SCHEDULE 40 GALV. PIPE	DIMENSIONS						
				B	C	D	E	G	R	J
375	1448	~	~	~	~	210	82	1219	76	229
450	1981	~	~	~	~	216	76	1752	76	229
600	3048	10	3800	152	610	229	64	2819	76	229



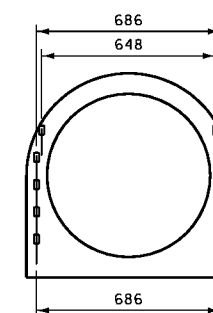
PLAN VIEW



SECTION A-A



END VIEW

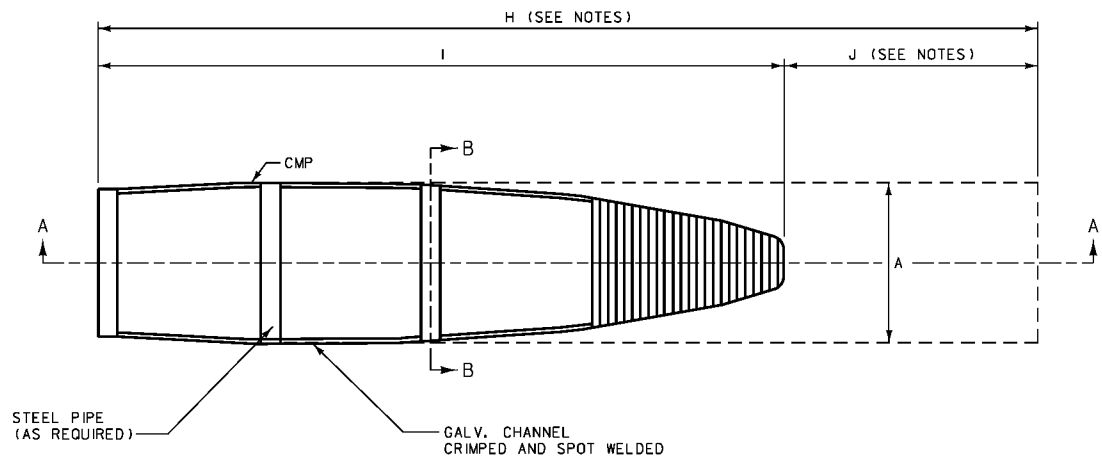


VIEW OF INSERTS

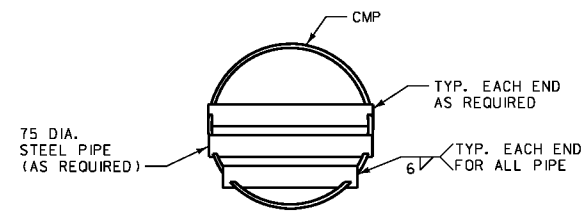
NOTE:  
PAINT ALL NON-GALVANIZED PARTS  
IN ACCORDANCE WITH SECTION 710  
OF THE STANDARD SPECIFICATIONS.

ALL DIMENSIONS ARE MILLIMETERS  
(mm) UNLESS OTHERWISE NOTED.

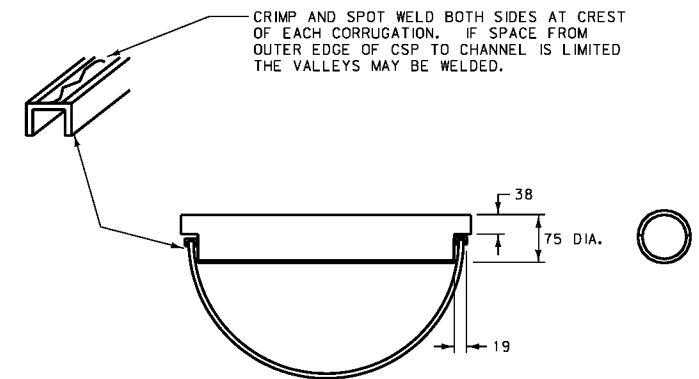
DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	603-12
SECTION 603, 710	
RCP ROAD APPROACH CULVERT END TREATMENT (RACET)	
EFFECTIVE: AUGUST 1999	



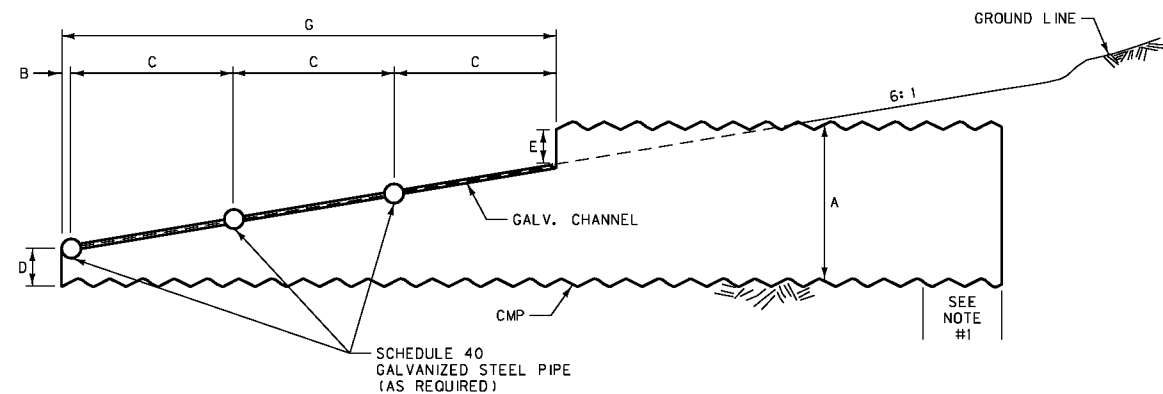
PLAN VIEW



END VIEW



SECTION B-B



SECTION A-A


ILLUSTRATED WITH 600 mm  
CMP (750 mm CMP UTILIZES  
FOUR GALV. STEEL PIPES)

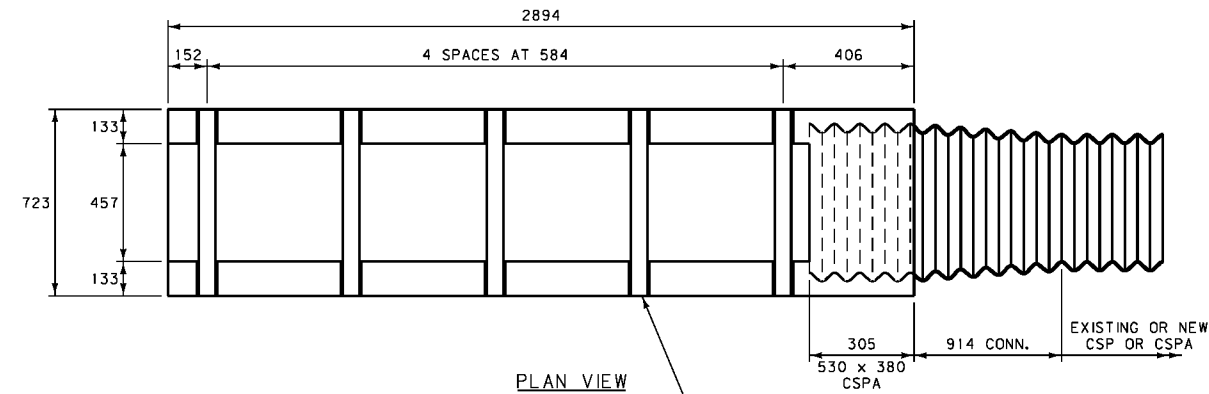
ROAD APPROACH CULVERT END TREATMENT										
QUANTITIES (FOR ESTIMATING ONLY)										
DIA. A CMP	H PIPE LENGTH	19 x 10 x 3.2 GALV. CHANNEL	LENGTH 75 DIA. SCHEDULE 40 GALV. PIPE	DIMENSIONS						
				B	C	D	E	G	I	J
375	2134	3048	~	~	~	61	61	1524	1829	305
450	2438	3048	~	~	~	101	101	1524	2133	305
600	3048	3656	1800	46	594	152	152	1828	2743	305
750	3810	4874	3000	61	594	183	183	2437	3505	305

NOTES:

- PIPE TO HAVE ANNULAR CORRUGATION OR REROLLED ENDS. USE ONLY APPROVED COUPLING BAND PER STANDARD SPECIFICATION 709.02 CMP. FOR RCP END TREATMENT, SEE DTL. DWG. NO. 603-26 FOR CONNECTION.
- THE TWO 19 mm CHANNELS MAY BE ELIMINATED FROM THE CULVERT END TREATMENT IF:
  - THE CULVERT IS FABRICATED WITH 12 GAGE (2.8 mm THICK) MATERIAL.
  - HALF CIRCLE NOTCHES ARE CUT IN THE CULVERT FOR THE STEEL PIPE WITH CONTINUOUS WELD OF THE PERIPHERY IN CONTACT PROVIDED.
  - ALL WELDS AND OTHER NON-GALVANIZED PARTS ARE PAINTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 710.
- CONNECTIONS MADE PER DTL. DWG. NO. 603-26 REQUIRE PIPE LENGTHS H AND J TO BE INCREASED BY 76 mm.

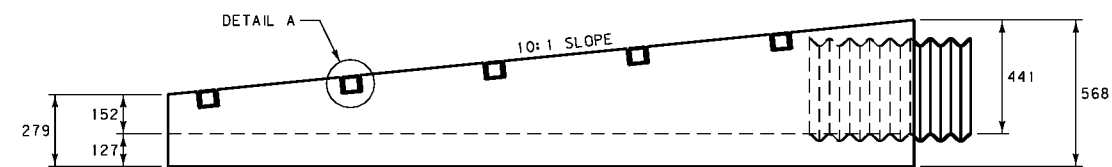
ALL DIMENSIONS ARE MILLIMETERS  
(mm) UNLESS OTHERWISE NOTED.

DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	603-14
SECTION 603, 709, 710	
CMP ROAD APPROACH CULVERT END TREATMENT (RACET)	
EFFECTIVE: AUGUST 1999	
 MONTANA DEPARTMENT OF TRANSPORTATION	MONTANA CADD

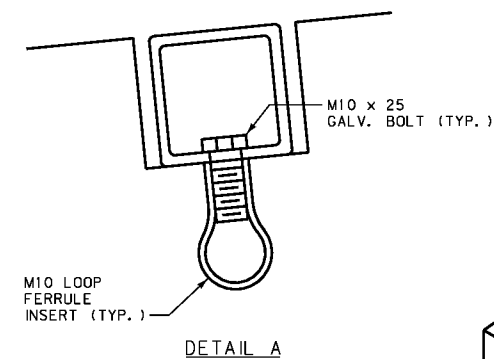


PLAN VIEW

64 x 64 x 6.4 GALV.  
STRUCTURAL TUBING CROSS-PIPE  
PER ASTM A 500 GRADE B





ELEVATION

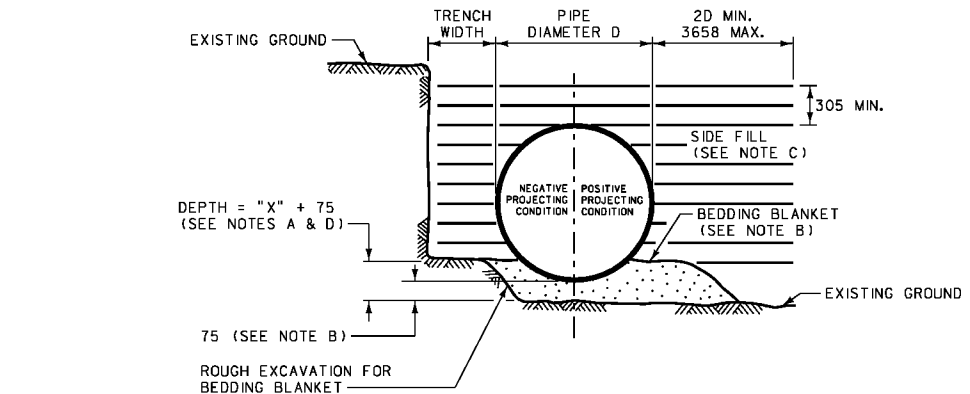


DETAIL A

NOTE:  
PAINT ALL EXPOSED METAL PARTS WITH ONE COAT OF ZINC  
RICH PAINT AND TWO COATS OF ALUMINUM PAINT ACCORDING  
TO STANDARD SPECIFICATION SECTION 710.

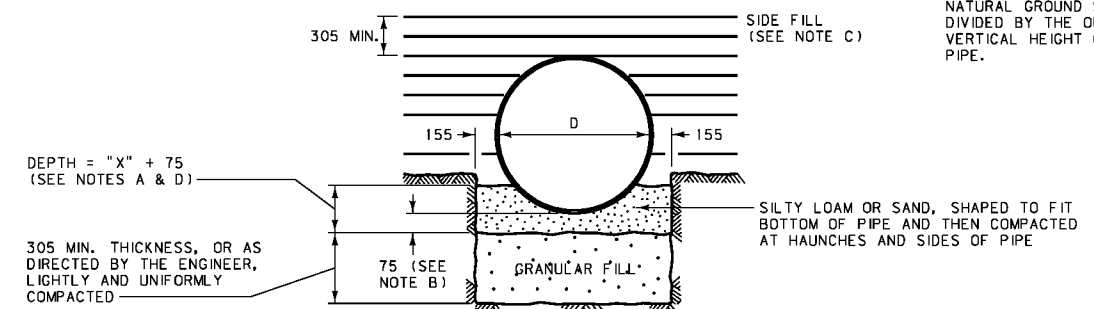
ALL DIMENSIONS ARE MILLIMETERS  
(mm) UNLESS OTHERWISE NOTED.

DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	603-17
SECTION 603, 708, 710	
PRECAST MEDIAN U-TURN CROSS DRAIN AND CONC. BEVELED END	
EFFECTIVE: AUGUST 1999	
 MONTANA DEPARTMENT OF TRANSPORTATION  MONTANA CADD	

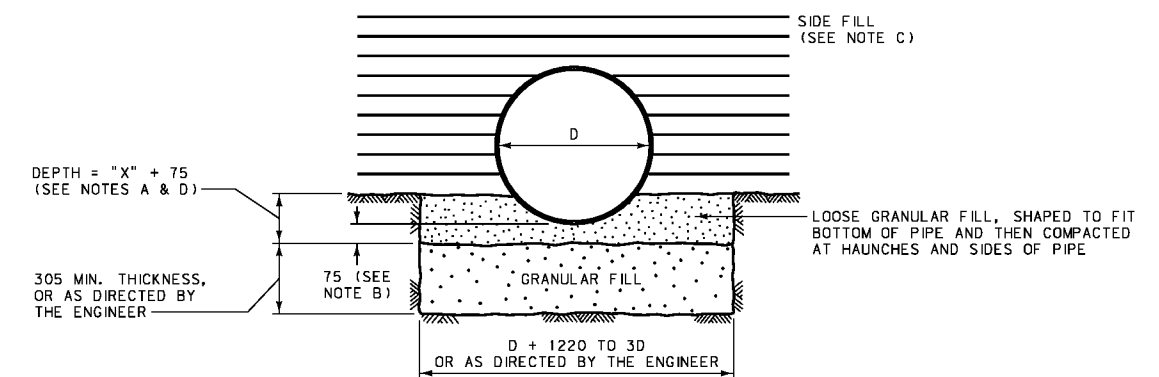


1- PIPE INSTALLATION AND BEDDING  
(CLASS C, MODIFIED)

NOTE: THE PROJECTION  
RATIO FOR POSITIVE  
EMBANKMENT INSTALLATIONS  
EQUALS THE VERTICAL  
DISTANCE BETWEEN THE  
TOP OF THE PIPE AND THE  
NATURAL GROUND SURFACE  
DIVIDED BY THE OUTSIDE  
VERTICAL HEIGHT OF THE  
PIPE.



2- ROCK





3- FOUNDATION STABILIZATION

NOTES:

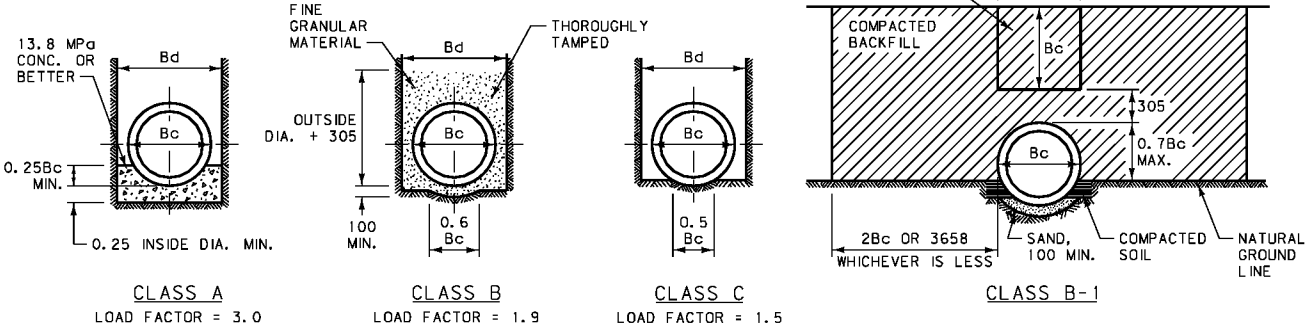
- FOR STRUCTURAL PLATE PIPE, THE LENGTH OF BEDDING ARC NEED NOT EXCEED WIDTH OF BOTTOM PLATE.
- SHAPE BEDDING BLANKET OF SILTY LOAM OR SAND TO FIT BOTTOM OF PIPE. THE MINIMUM THICKNESS BEFORE PLACING PIPE IS 75 mm.
- COMPACT SIDE FILL IN 155 mm LAYERS TO DENSITY SPECIFIED FOR ADJACENT EMBANKMENT. SEE SECTION 203.03.3 OF THE STANDARD SPECIFICATIONS FOR THE DENSITY REQUIREMENTS.
- SEE DTL. DWG. NO. 603-08 AND 603-32 FOR "X" DIMENSIONS ON CONCRETE CULVERTS AND DTL. DWG. NO. 603-10 AND 603-34 FOR "X" DIMENSIONS ON METAL CULVERTS.

ALL DIMENSIONS ARE MILLIMETERS  
(mm) UNLESS OTHERWISE NOTED.

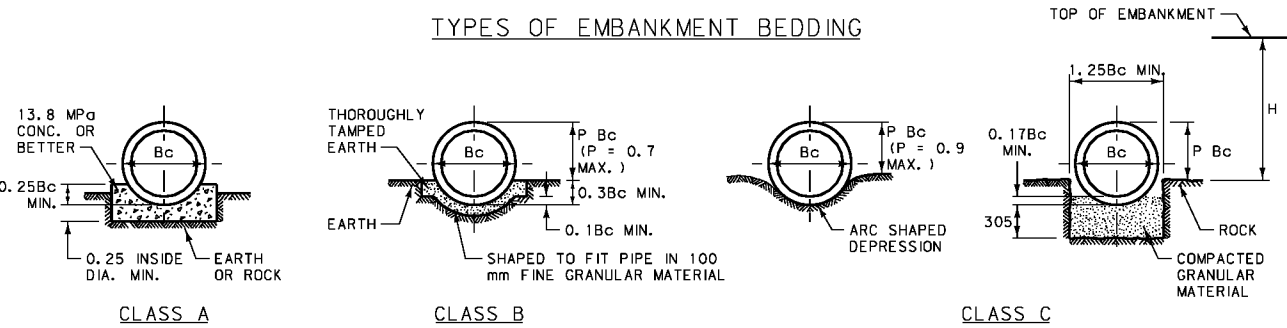
DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	603-18
SECTION 207, 603, 701	
CSP AND SSPP CULVERT BEDDING	
EFFECTIVE: AUGUST 1999	
 MONTANA DEPARTMENT OF TRANSPORTATION  MONTANA CADD	

TYPES OF TRENCH BEDDING

NOTE: THE PROJECTION RATIO (P) FOR POSITIVE EMBANKMENT INSTALLATIONS EQUALS THE VERTICAL DISTANCE BETWEEN THE TOP OF THE PIPE AND THE NATURAL GROUND SURFACE DIVIDED BY THE OUTSIDE VERTICAL HEIGHT OF THE PIPE.



TYPES OF EMBANKMENT BEDDING



DESCRIPTION OF BEDDING CLASSES

CLASS A CONCRETE CRADLE BEDDING.

THE LOWER PART OF THE PIPE EXTERIOR IS BEDDED IN A CONTINUOUS CRADLE CONSTRUCTED OF 13.8 MPa CONCRETE OR BETTER, HAVING A MINIMUM THICKNESS UNDER THE PIPE OF ONE-FOURTH THE NOMINAL INSIDE DIAMETER AND EXTENDING UP THE SIDES OF THE PIPE FOR A HEIGHT EQUAL TO ONE-FOURTH OF THE OUTSIDE DIAMETER. THE CRADLE HAS A MINIMUM WIDTH EQUAL TO THE OUTSIDE DIAMETER OF THE PIPE PLUS 205 mm, AND IS CONSTRUCTED MONOLITHICALLY WITHOUT HORIZONTAL CONSTRUCTION JOINTS.

CLASS B BEDDING

(1) THIS CLASS OF BEDDING FOR EMBANKMENT CONDITIONS IS APPLICABLE ONLY WHEN THE PROJECTION RATIO IS 0.7 AND LESS. THE PIPE IS BEDDED CAREFULLY ON FINE GRANULAR MATERIALS OVER AN EARTH FOUNDATION, ACCURATELY SHAPED BY MEANS OF A TEMPLATE TO FIT THE LOWER PART OF THE PIPE EXTERIOR FOR AT LEAST 10% OF THE CULVERT OVERALL HEIGHT. THEN COMPACTABLE SOIL MATERIAL IS RAMMED AND TAMPED IN LAYERS NOT MORE THAN 155 mm THICK AROUND THE PIPE FOR THE REMAINDER OF THE LOWER 20% OF ITS HEIGHT. BACK-FILLING IS COMPLETED TO THE TOP OF THE PIPE, CONFORMING WITH THE APPLICABLE PROVISIONS OF THE STANDARD SPECIFICATIONS.

(2) FOR TRENCH CONDITIONS, THE CULVERT IS PLACED AS DESCRIBED IN B(1) EXCEPT THAT THE EARTH FOUNDATION IS SHAPED TO FIT THE LOWER PART OF THE CULVERT EXTERIOR FOR A WIDTH OF AT LEAST 60% OF THE CULVERT BREADTH. THEN THE REMAINDER OF THE CULVERT IS ENTIRELY SURROUNDED TO A HEIGHT OF AT LEAST 305 mm ABOVE ITS TOP WITH GRANULAR MATERIAL PLACED BY HAND TO FILL ALL SPACES UNDER AND ADJACENT TO THE CULVERT. THE FILL IS TAMPED THOROUGHLY ON EACH SIDE AND UNDER THE CULVERT AS FAR AS PRACTICAL IN LAYERS NOT TO EXCEED 155 mm IN THICKNESS.

CLASS B-1 BEDDING

IN THIS TYPE OF INSTALLATION, SOMETIMES CALLED THE IMPERFECT TRENCH METHOD, THE PIPE CULVERT IS FIRST INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF B(2). THEN THE FILL IS COMPACTED AT EACH SIDE OF THE PIPE FOR A LATERAL DISTANCE EQUAL TO TWICE THE OUTSIDE DIAMETER OR 3660 mm, WHICHEVER IS LESS, AND CARRIED UP TO AN ELEVATION ABOVE THE TOP OF THE PIPE EQUAL TO THE OUTSIDE DIAMETER OF THE PIPE PLUS 305 mm. NEXT A TRENCH IS DUG EQUAL IN WIDTH TO THE OUTSIDE DIAMETER OF THE PIPE IN THE FILL DIRECTLY OVER THE CULVERT, DOWN TO AN ELEVATION 305 mm ABOVE THE TOP OF THE PIPE. CARE IS EXERCISED TO KEEP THE SIDES AS VERTICAL AS POSSIBLE. AFTER THE TRENCH IS EXCAVATED, IT IS REFILLED WITH LOOSE, HIGHLY COMPRESSIBLE SOIL MATERIAL. STRAW, HAY, LEAVES, BRUSH OR SAWDUST MAY BE USED TO FILL THE LOWER ONE-FOURTH TO ONE-THIRD OF THE TRENCH IN ORDER TO INSURE HIGH COMPRESSIBILITY OF THE BACKFILL. THIS BACKFILL OF STRAW, HAY, ETC. MAY NOT BE CARRIED CLOSER THAN 3050 mm TO THE OUTSIDE SLOPE OF THE FILL; THE OUTSIDE 3050 mm IS COMPOSED OF IMPERVIOUS MATERIAL, THOROUGHLY COMPACTED. AFTER THE BACKFILL IS COMPLETED, THE BALANCE OF THE FILL IS CONSTRUCTED BY NORMAL METHODS UP TO THE FINISHED GRADE OF EMBANKMENT.

CLASS C BEDDING

FOR PROJECTING EMBANKMENT CULVERTS, THIS METHOD OF BEDDING IS WITH "ORDINARY" CARE IN AN EARTH FOUNDATION SHAPED IN THE FORM OF AN ARC TO FIT THE LOWER PART OF THE CULVERT EXTERIOR WITH REASONABLE CLOSENESS FOR AT LEAST 10% OF ITS OVERALL HEIGHT. THE REMAINDER OF PIPE IS SURROUNDED BY MATERIAL PLACED BY HAND TOOLS TO COMPLETELY FILL ALL SPACES UNDER AND ADJACENT TO THE PIPE. THEN BACKFILLING IS COMPLETED

TO THE TOP AS SPECIFIED IN THE STANDARD SPECIFICATIONS. IF THE CULVERT IS PLACED ON ROCK FOUNDATIONS, PROJECTING EMBANKMENT CULVERT PIPES ARE BEDDED ON AN EARTH CUSHION HAVING A MINIMUM ALLOWABLE THICKNESS OF 305 mm ± WITH THE EARTH FOUNDATION CAREFULLY SHAPED AND FILLED AROUND THE CULVERT THE SAME AS ORDINARY PROJECTING EMBANKMENT BEDDING ON AN EARTH FOUNDATION.

CLASS C-1 BEDDING

THE PIPE IS INSTALLED IN ACCORDANCE WITH CLASS C BEDDING, USING THE IMPERFECT TRENCH METHOD AS DESCRIBED UNDER CLASS B-1 BEDDING.

WHEN NATURAL GROUND MATERIAL SIMULATES BEDDING MATERIAL, NO SPECIAL BEDDING MATERIAL NEED BE USED. CLASS C BEDDING IS USED UNLESS OTHERWISE NOTED ON THE PLANS.

COMPACTION

ALL FOUNDATIONS REQUIRE COMPACTION.

ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

DETAILED DRAWING

REFERENCE DWG. NO.  
STANDARD SPEC. 603-20  
SECTION 207, 603, 701

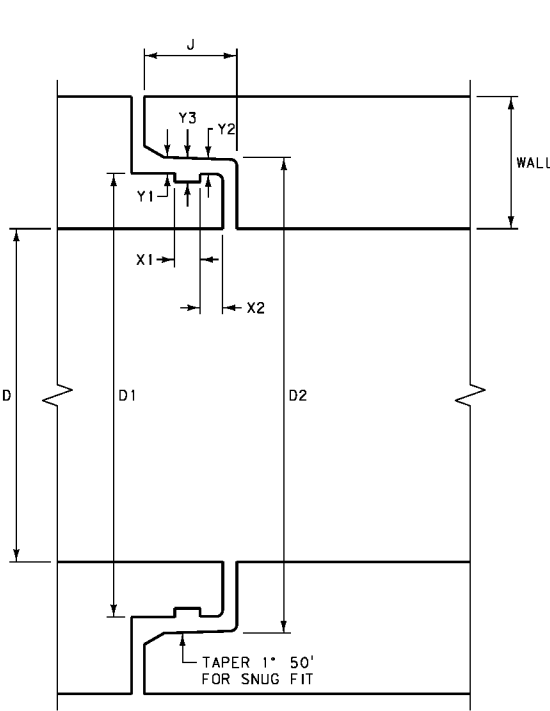
RCP  
CULVERT BEDDING

EFFECTIVE: AUGUST 1999

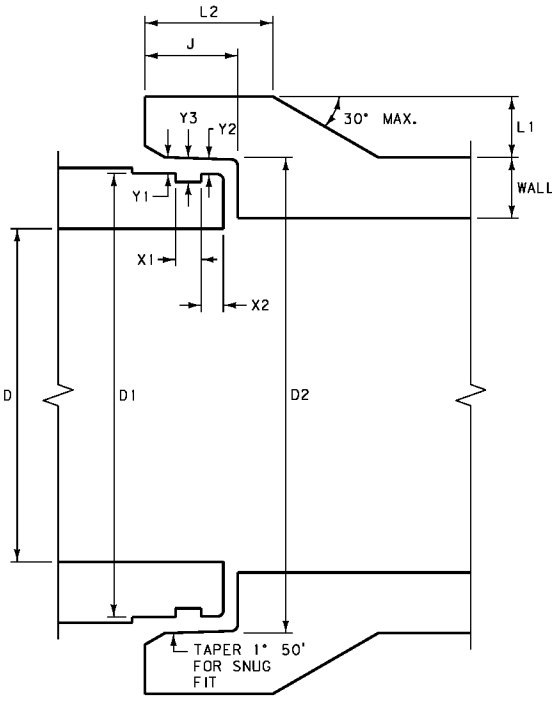


DIA. D	APPROX. DIA. GASKET MATL. NOT STRETCHED	LENGTH OF JOINT J	D1	D2	L2 (MIN. )	L1 (WALL "B" )	L1 (WALL "C" )	X1	X2	Y1	Y2	Y3
300	16.67	92.08	386.66	389.41	127.00	50.80	~	25.40	22.23	1.57	2.29	7.95
375	16.67	92.08	475.56	478.31	120.65	55.56	~	25.40	22.23	1.57	2.29	7.95
450	16.67	92.08	561.29	564.03	127.00	60.33	~	25.40	22.23	1.57	2.29	7.95
525	16.67	98.43	650.24	653.39	133.35	65.09	~	25.40	22.23	1.57	2.29	7.95
600	16.67	98.43	735.97	739.11	139.70	69.85	50.80	25.40	22.23	1.57	2.29	7.95
675	16.67	101.60	824.89	828.24	139.70	69.85	50.80	25.40	22.23	1.57	2.29	7.95
750	16.67	101.60	913.79	917.14	139.70	69.85	50.80	25.40	22.23	1.57	2.29	7.95
825	16.67	104.78	1002.69	1006.25	146.05	73.03	53.98	25.40	22.23	1.57	2.29	7.95
900	16.67	104.78	1091.59	1095.15	152.40	79.38	60.33	25.40	22.23	1.57	2.29	7.95
1050	19.05	117.48	1274.65	1274.65	171.45	95.25	76.20	30.16	25.40	1.70	3.28	9.55
1200	19.05	120.65	1448.38	1452.70	184.15	104.78	85.73	30.16	25.40	1.70	3.28	9.55
1350	19.05	127.00	1600.38	1605.08	190.50	92.08	73.03	30.16	25.40	1.70	3.28	9.55
1500	19.05	127.00	1752.78	1757.48	190.50	79.38	60.33	30.16	25.40	1.70	3.28	9.55
1650	20.64	127.00	1905.18	1909.88	190.50	69.85	50.80	30.16	25.40	1.70	3.28	9.55
1800	20.64	133.35	2012.95	2016.76	~	~	~	30.16	31.75	2.36	4.83	9.55
1950	20.64	133.35	2190.75	2194.56	~	~	~	30.16	31.75	2.36	4.83	9.55
2100	20.64	133.35	2324.10	2327.91	~	~	~	30.16	31.75	2.36	4.83	9.55
2250	20.64	133.35	2482.85	2486.66	~	~	~	30.16	31.75	2.36	4.83	9.55
2400	20.64	133.35	2647.95	2651.76	~	~	~	30.16	31.75	2.36	4.83	9.55
2550	20.64	133.35	2813.05	2816.86	~	~	~	30.16	31.75	2.36	4.83	9.55
2700	20.64	133.35	2978.15	2981.96	~	~	~	30.16	31.75	2.36	4.83	9.55

1800 DIA. PIPES AND LARGER



1650 DIA. PIPES AND SMALLER



NOTES:

TYPICAL FOR STORM DRAIN AND IRRIGATION APPLICATIONS (FOR HEADS UP TO 6.1 m).

USE RUBBER GASKETS THAT MEET THE REQUIREMENTS OF STANDARD SPECIFICATION 707.02.1.

ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

DETAILED DRAWING

REFERENCE DWG. NO.  
STANDARD SPEC. 603-22  
SECTION 603, 707, 708

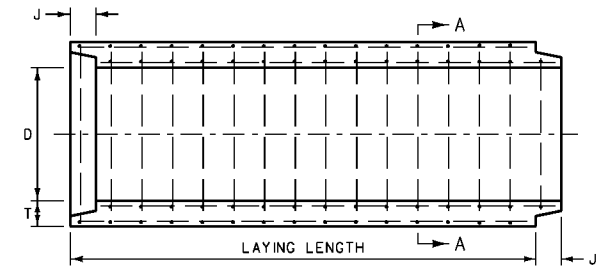
WATER TIGHT JOINT FOR  
REINFORCED CONCRETE PIPE

EFFECTIVE: AUGUST 1999

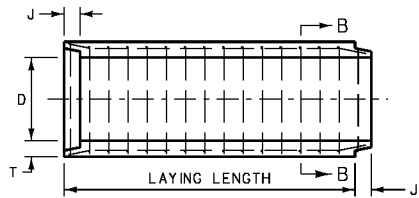


DIA. D	XSEC. WATER AREA (m <sup>2</sup> )	WT. PER m OF PIPE (kg)	T * MIN. WALL THICKNESS	J LENGTH OF JOINT	A (NOMINAL) = $\frac{D2 - D1}{2}$	D1	D2	D3	D4
300	0.073	136.9	50.8	44.45	4.76	336.55	346.08	352.43	361.95
375	0.114	189.0	57.2	50.80	4.76	419.10	428.63	438.15	447.68
450	0.164	250.0	63.5	57.15	4.76	498.48	508.00	517.53	527.05
525	0.223	318.5	69.9	63.50	4.76	581.03	590.55	603.25	612.78
600	0.292	394.4	76.2	69.85	4.76	660.40	669.93	685.80	695.33
675	0.369	479.2	82.6	76.20	4.76	742.95	752.48	768.35	777.88
750	0.456	571.5	88.9	82.55	4.76	822.33	831.85	850.90	860.43
825	0.552	672.6	95.3	88.90	6.35	901.70	914.40	933.45	946.15
900	0.657	779.8	101.6	95.25	6.35	984.25	996.95	1016.00	1028.70
1050	0.894	1019.4	114.3	101.60	6.35	1146.18	1152.53	1181.10	1193.80
1200	1.167	1290.2	127.0	107.95	6.35	1308.10	1320.80	1346.20	1358.90
1350	1.478	1592.3	139.7	114.30	6.35	1470.03	1482.73	1508.13	1520.83
1500	1.824	1928.7	152.4	127.00	6.35	1631.95	1644.65	1676.40	1689.10
1650	2.207	2294.7	165.1	139.70	6.35	1793.88	1806.58	1841.50	1854.20
1800	2.627	2693.6	177.8	152.40	6.35	1955.80	1968.50	2006.60	2019.30
1950	3.083	3122.2	190.5	165.10	6.35	2117.73	2130.43	2174.88	2192.87
2100	3.575	3586.5	203.2	177.80	6.35	2279.65	2292.35	2339.98	2352.68
2250	4.104	4077.6	215.9	177.80	6.35	2432.05	2444.75	2492.38	2505.08
2400	4.670	4390.1	228.6	177.80	6.35	2593.98	2606.68	2654.30	2667.00
2550	5.272	4576.1	241.3	190.50	6.35	2768.60	2781.30	2832.10	2844.80
2700	5.910	5759.2	254.0	190.50	6.35	2933.70	2946.40	2997.20	3009.90

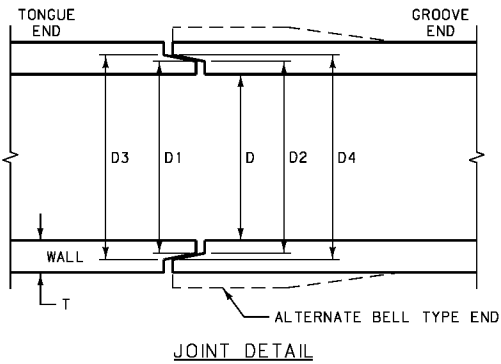
\* WALL "B" THICKNESS



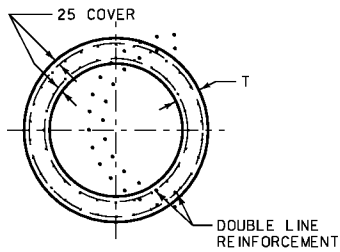
TYPICAL LONGITUDINAL SECTION  
900 DIAMETER PIPES AND LARGER



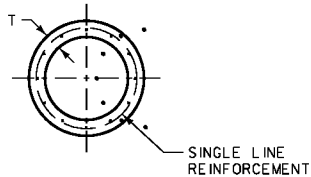
TYPICAL LONGITUDINAL SECTION  
825 DIAMETER PIPES AND SMALLER



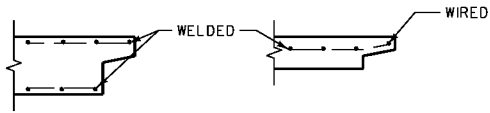
JOINT DETAIL



SECTION A-A



SECTION B-B



REINFORCING AT ENDS OF PIPE

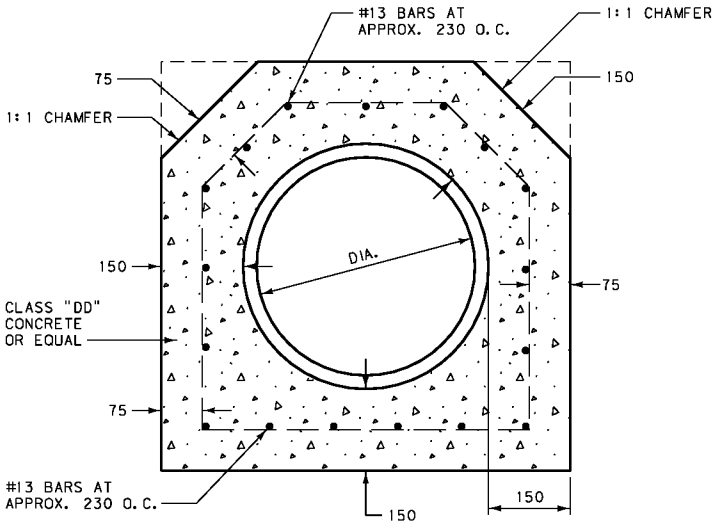
NOTES:

TOLERANCES IN DIMENSIONS IN ACCORDANCE  
WITH AASHTO M 170M.

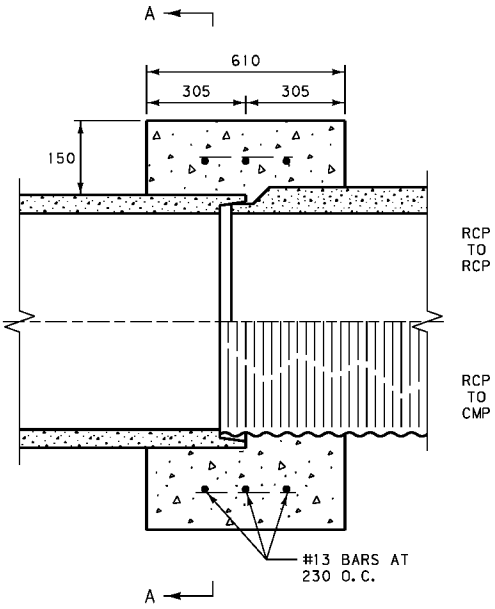
TYPICAL FOR DRAINAGE APPLICATIONS.

ALL DIMENSIONS ARE MILLIMETERS  
(mm) UNLESS OTHERWISE NOTED.

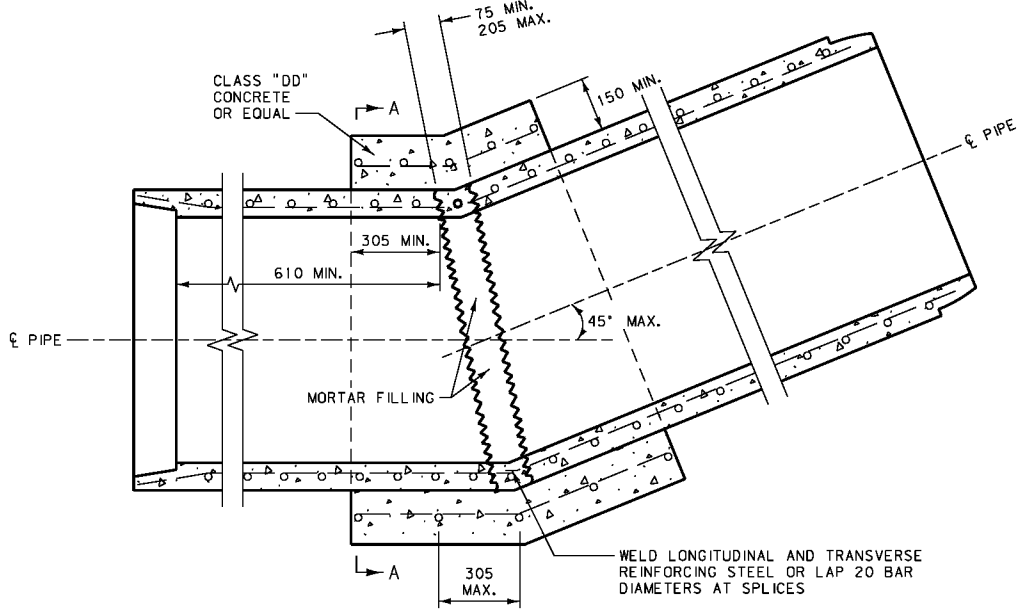
DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 603, 708	DWG. NO. 603-24
REINFORCED CONCRETE PIPE JOINT	
EFFECTIVE: AUGUST 1999	
<div> <div>MT</div> <div>MONTANA DEPARTMENT OF TRANSPORTATION</div> <div>MONTANA CADD</div> </div>	



SECTION A-A



CONNECTION DETAILS

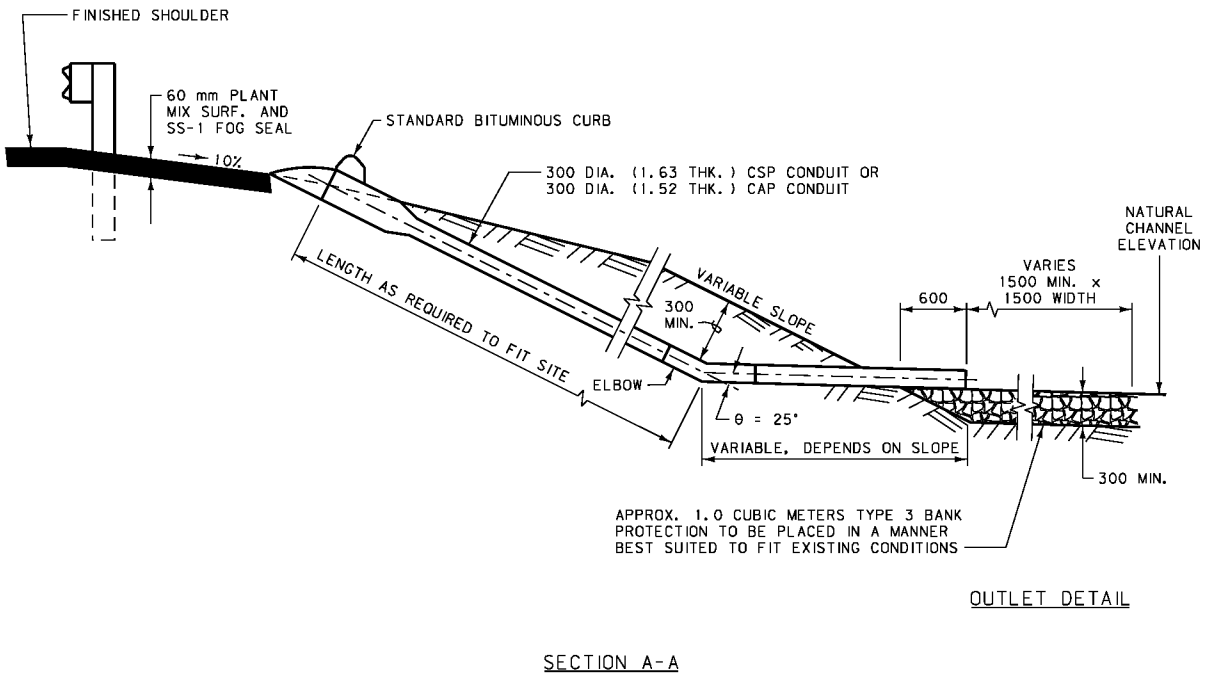
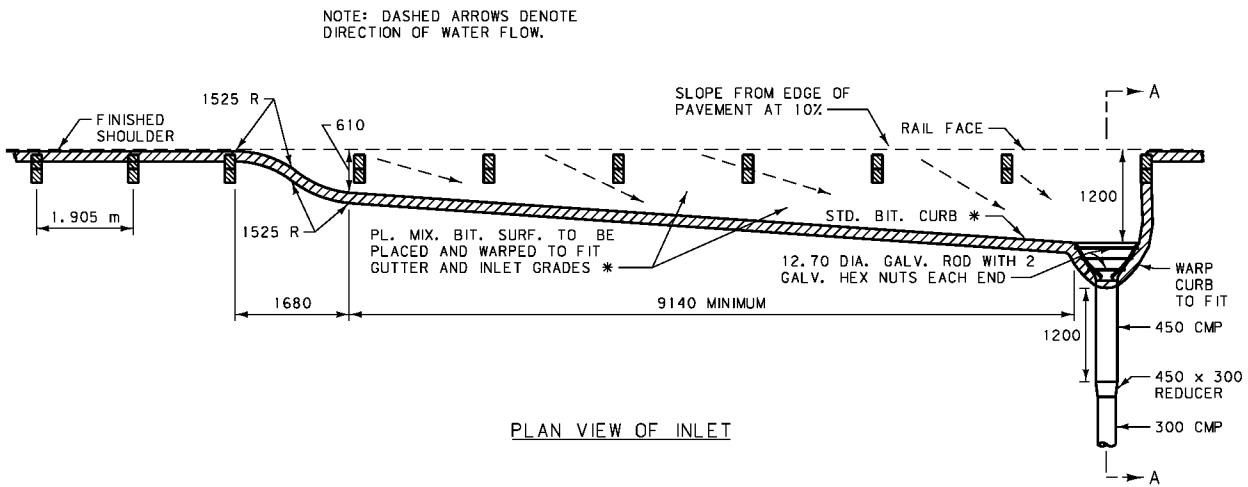


TYPICAL FIELD CAST CONCRETE BEND

ALL DIMENSIONS ARE MILLIMETERS  
(mm) UNLESS OTHERWISE NOTED.



DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 603, 708	DWG. NO. 603-26
TYPICAL FIELD CAST CONCRETE CONNECTIONS	
EFFECTIVE: AUGUST 1999	
<div> <div>MT</div> <div>MONTANA DEPARTMENT OF TRANSPORTATION</div> <div>MONTANA CADD</div> </div>	

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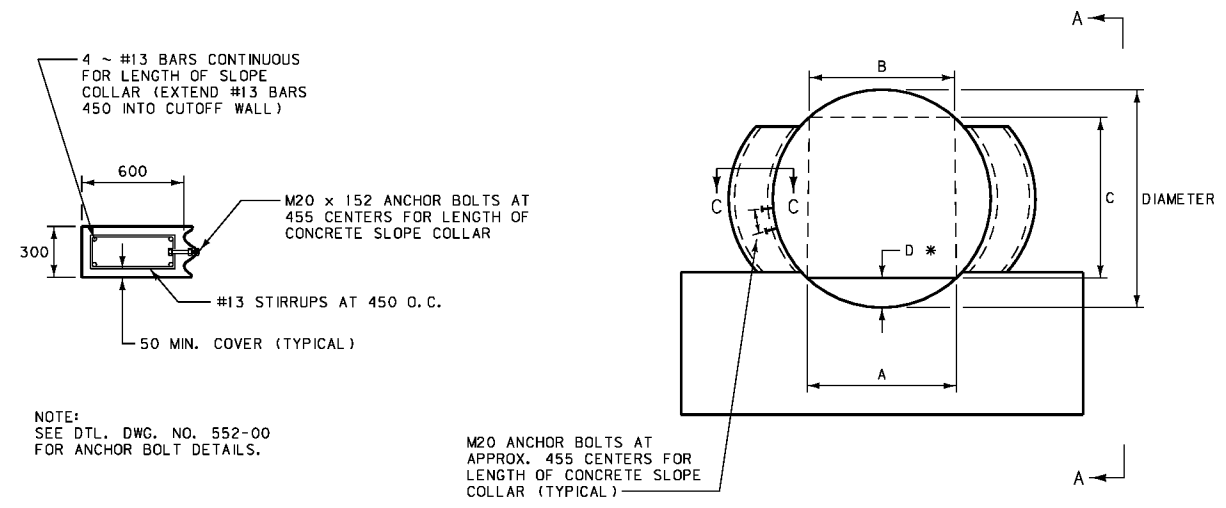


NOTES:  
CORRUGATION MAY BE EITHER ANNULAR OR HELICAL.  
BEND ON ELBOW ( $\theta$ ) IS AS SHOWN UNLESS OTHERWISE SPECIFIED IN THE PLANS OR BY THE ENGINEER.  
\* INCLUDED WITH ROADWAY QUANTITIES.

ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 603	DWG. NO. 603-28
EMBANKMENT PROTECTOR	
EFFECTIVE: AUGUST 1999	
 MONTANA DEPARTMENT OF TRANSPORTATION	 MONTANA CADD

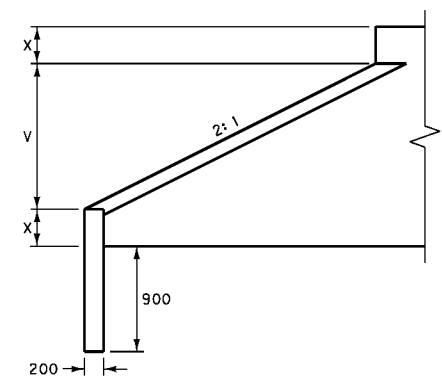




NOTE:  
SEE DTL. DWG. NO. 552-00  
FOR ANCHOR BOLT DETAILS.

SECTION C-C

ELEVATION



SECTION A-A

NOTES:

DESIGNATE THESE STRUCTURES, IN PLANS AND PROPOSAL, AS "VEHICULAR UNDERPASS." CONFORM MATERIALS, INSTALLATION, AND OTHER PROVISIONS TO THE STANDARD SPECIFICATIONS. USE THE TERM "VEHICULAR UNDERPASS," REGARDLESS OF THE USE OR PURPOSE OF THE STRUCTURE.

PROVIDE END TREATMENT FOR ALL VEHICULAR UNDERPASSES INCLUDING CUTOFF WALLS, BACKFILL RETAINING WALLS AND CONCRETE SLOPE COLLARS.

PROVIDE SURFACING FOR THE INSIDE OF THE STRUCTURE, CROSS-SLOPED TO ALLOW A DRAINAGE COURSE ALONG ONE SIDE.

FOR PLATE THICKNESS SEE ROAD DESIGN MANUAL FILL HEIGHT TABLES.

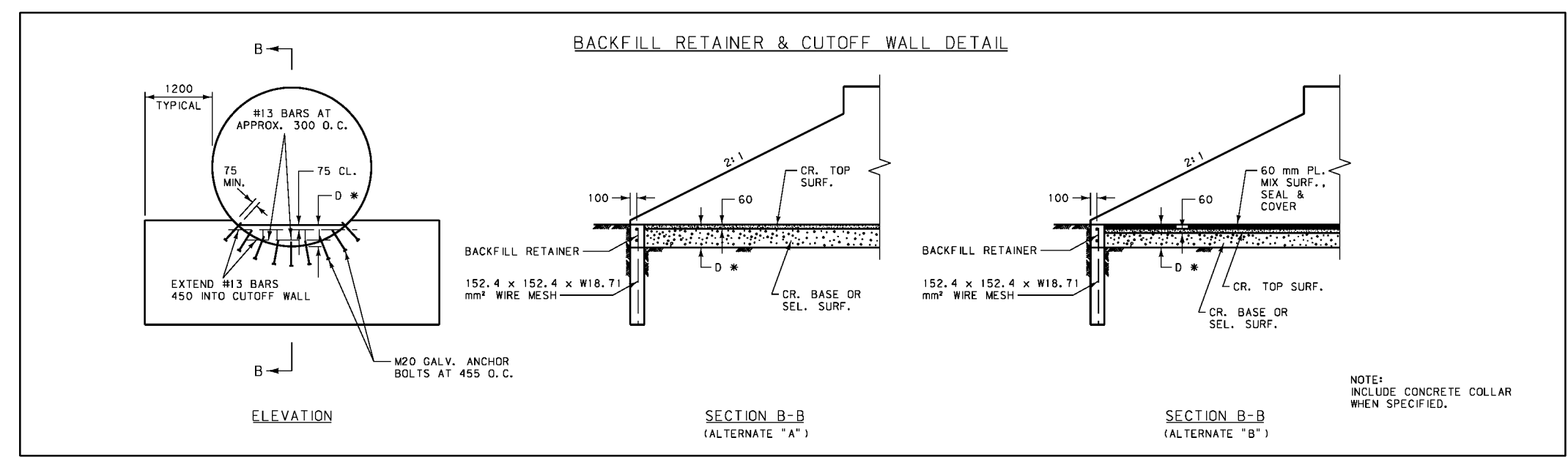
USE CLASS "DD" CONCRETE OR EQUAL.

SEE DTL. DWG. NO. 552-08 FOR QUANTITIES.

DEPTH OF SURFACING *		
MATERIAL	ALTERNATE "A"	ALTERNATE "B"
PL. MIX SURF.	—	60
CR. TOP SURF.	60	60
CR. BASE OR SELECT SURF.	BAL.	BAL.

DIAMETER	A (m)	B (m)	C (m)	V (m)	X (m)	* D	BACKFILL RETAINER (m³)	CONCRETE COLLAR (m³)
2400	1.2	1.2	2.078	1.200	0.600	173	0.03	0.50
3000	2.1	2.1	2.142	1.500	0.750	441	0.13	0.63
3.825 m	3.0	2.4	2.683	1.916	0.957	750	0.32	0.80
4.135 m	3.0	2.4	3.114	2.071	1.035	669	0.28	0.87
4.755 m	3.6	3.0	3.407	2.381	1.190	848	0.43	1.00
4.910 m	3.6	3.0	3.622	2.459	1.229	809	0.41	1.03
5.220 m	3.6	3.0	4.035	2.613	1.307	744	0.38	1.10
5.530 m	3.6	3.0	4.431	2.770	1.384	690	0.35	1.16
5.840 m	4.8	3.6	3.975	2.924	1.462	1279	0.87	1.23
6.150 m	4.8	3.6	4.428	3.079	1.540	1176	0.80	1.29

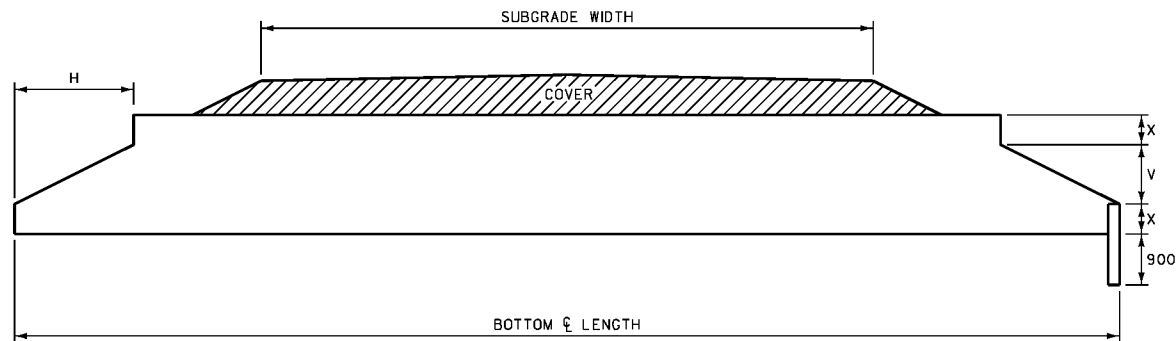
SURFACING QUANTITIES PER METER FOR DEPTH "D" *									
DIAMETER	ALTERNATE "A"		ALTERNATE "B"						
	m³ SURFACING		TONS SURFACING		m³ SURFACING		TONS BIT. MATL.		
	CRUSHED TOP SURF.	CR. BASE OR SEL. SURF.	COVER MATERIAL	PLANT MIX	CRUSHED TOP SURF.	CR. BASE OR SEL. SURF.	PLANT MIX	PRIME	SEAL
2400	0.069	0.078	0.0175	0.158	0.053	0.025	0.0095	0.0015	0.0020
3000	0.124	0.525	0.0299	0.284	0.116	0.409	0.0170	0.0029	0.0034
3.825 m	0.181	1.423	0.0429	0.414	0.175	1.248	0.0248	0.0042	0.0049
4.135 m	0.181	1.239	0.0430	0.414	0.174	1.065	0.0248	0.0042	0.0049
4.755 m	0.217	1.942	0.0513	0.496	0.210	1.732	0.0298	0.0051	0.0059
4.910 m	0.217	1.839	0.0514	0.496	0.210	1.629	0.0298	0.0051	0.0059
5.220 m	0.217	1.665	0.0514	0.496	0.209	1.456	0.0298	0.0051	0.0059
5.530 m	0.217	1.524	0.0515	0.496	0.208	1.316	0.0298	0.0050	0.0059
5.840 m	0.289	4.079	0.0681	0.661	0.284	3.795	0.0397	0.0068	0.0078
6.150 m	0.289	3.696	0.0681	0.661	0.283	3.413	0.0397	0.0068	0.0078



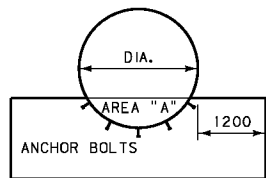
NOTE:  
INCLUDE CONCRETE COLLAR  
WHEN SPECIFIED.

ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	603-30
SECTION 552, 603	
VEHICULAR UNDERPASS AND BACKFILL RETAINER & CUTOFF WALL DETAIL	
EFFECTIVE: AUGUST 1999	
MONTANA DEPARTMENT OF TRANSPORTATION	MONTANA CADD



NOTE:  
FOR DETAILS COVERING CUTOFF WALLS  
SEE DTL. DWG. NO. 552-00.



DIA.	X (m)	V (m)	H (m) FOR BEVELS:		AREA "A" (m <sup>2</sup> ) *
			1.5 : 1	2 : 1	
CSP 75 x 25 OR 125 x 25 CORRUGATIONS					
1200	0.300	0.600	0.900	1.200	0.24
1350	0.338	0.674	1.011	1.348	0.30
1500	0.375	0.750	1.125	1.500	0.37
1650	0.412	0.826	1.239	1.652	0.44
1800	0.450	0.900	1.350	1.800	0.52
1950	0.488	0.974	1.461	1.948	0.61
2100	0.525	1.050	1.575	2.100	0.70
2250	0.563	1.124	1.686	2.248	0.81
2400	0.600	1.200	1.800	2.400	0.92
2550	0.637	1.276	1.914	2.552	1.03
2700	0.675	1.350	2.025	2.700	1.15
2850	0.712	1.426	2.139	2.852	1.28
3000	0.750	1.500	2.250	3.000	1.42

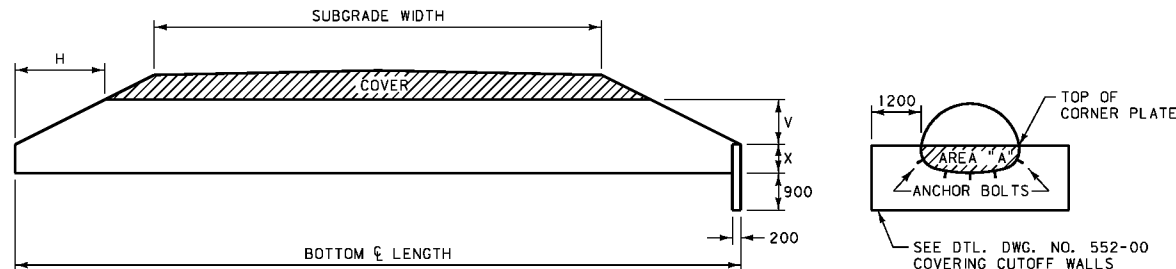
DIA.	X (m)	V (m)	H (m) FOR BEVELS:		AREA "A" (m²) *
			1.5: 1	2: 1	
SSPP 152 x 51 CORRUGATIONS					
3.205	0.802	1.605	2.408	3.210	1.67
3.360	0.841	1.682	2.523	3.364	1.83
3.515	0.880	1.760	2.640	3.520	2.00
3.670	0.919	1.837	2.756	3.674	2.17
3.825	0.957	1.916	2.874	3.832	2.36
3.980	0.996	1.993	2.990	3.986	2.55
4.135	1.035	2.071	3.107	4.142	2.74
4.290	1.074	2.148	3.222	4.296	2.95
4.445	1.113	2.225	3.338	4.450	3.16
4.600	1.152	2.302	3.453	4.604	3.38
4.755	1.190	2.381	3.572	4.762	3.61
4.910	1.229	2.459	3.689	4.918	3.84
5.065	1.268	2.536	3.804	5.072	4.09
5.220	1.307	2.613	3.920	5.226	4.34
5.375	1.346	2.690	4.035	5.380	4.59
5.530	1.384	2.770	4.155	5.540	4.86
5.685	1.423	2.847	4.271	5.694	5.13
5.840	1.462	2.924	4.386	5.848	5.41
5.995	1.501	3.001	4.502	6.002	5.69
6.150	1.540	3.079	4.619	6.158	5.99
6.305	1.578	3.158	4.737	6.316	6.29
6.460	1.617	3.235	4.853	6.470	6.60

\* AREA "A" IS TO THE MIDDLE OF THE CORRUGATIONS.

# NOMINAL DIAMETER

ALL DIMENSIONS ARE MILLIMETERS  
(mm) UNLESS OTHERWISE NOTED.

DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 603	DWG. NO. 603-32
STEP BEVEL FOR CIRCULAR METAL CULVERT	
EFFECTIVE: AUGUST 1999	



SPAN (m)	RISE (m)	X (m)	V (m)	H (m) FOR BEVELS:			AREA "A" (m <sup>2</sup> )
				1.5:1	2:1	2.5:1	
SSPPA 152 × 51 CORRUGATIONS WITH 457 CORNER RADIUS							
1.850	1.400	0.533	0.867	1.301	1.734	2.168	0.88
1.930	1.450	0.521	0.929	1.394	1.858	2.323	0.91
2.060	1.500	0.559	0.941	1.412	1.882	2.353	1.01
2.130	1.550	0.544	1.006	1.509	2.012	2.515	1.04
2.210	1.600	0.528	1.072	1.608	2.144	2.680	1.06
2.340	1.650	0.569	1.081	1.622	2.162	2.703	1.18
2.410	1.700	0.551	1.149	1.724	2.298	2.873	1.19
2.490	1.750	0.531	1.219	1.829	2.438	3.048	1.21
2.620	1.800	0.577	1.223	1.835	2.446	3.058	1.34
2.690	1.850	0.556	1.294	1.941	2.588	3.235	1.35
2.840	1.910	0.605	1.305	1.958	2.610	3.263	1.50
2.900	1.960	0.582	1.378	2.067	2.756	3.445	1.50
2.970	2.010	0.556	1.454	2.181	2.908	3.635	1.50
3.120	2.060	0.610	1.450	2.175	2.900	3.625	1.66
3.250	2.110	0.663	1.447	2.171	2.894	3.618	1.85
3.330	2.160	0.638	1.522	2.283	3.044	3.805	1.84
3.480	2.210	0.696	1.514	2.271	3.028	3.785	2.04
3.530	2.260	0.668	1.592	2.388	3.184	3.980	2.03
3.610	2.310	0.640	1.670	2.505	3.340	4.175	2.01
3.760	2.360	0.698	1.662	2.493	3.324	4.155	2.22
3.810	2.410	0.671	1.739	2.609	3.478	4.348	2.20
3.860	2.460	0.640	1.820	2.730	3.640	4.550	2.17
3.910	2.540	0.610	1.930	2.895	3.860	4.825	2.13
4.090	2.570	0.671	1.899	2.849	3.798	4.748	2.37
SSPPA 152 × 51 CORRUGATIONS WITH 787 CORNER RADIUS							
4.040	2.840	1.189	1.651	2.477	3.302	4.128	4.25
4.110	2.900	1.158	1.742	2.613	3.484	4.355	4.21
4.270	2.950	1.219	1.731	2.597	3.462	4.328	4.56
4.320	3.000	1.158	1.842	2.763	3.684	4.605	4.42
4.390	3.050	1.128	1.922	2.883	3.844	4.805	4.40
4.550	3.100	1.219	1.881	2.822	3.762	4.703	4.87
4.670	3.150	1.311	1.839	2.759	3.678	4.598	5.35
4.750	3.200	1.250	1.950	2.925	3.900	4.875	5.20
4.830	3.250	1.189	2.061	3.092	4.122	5.153	5.03
4.950	3.300	1.311	1.989	2.984	3.978	4.973	5.68
5.030	3.350	1.250	2.100	3.150	4.200	5.250	5.52
5.180	3.400	1.341	2.059	3.089	4.118	5.148	6.02
5.230	3.450	1.311	2.139	3.209	4.278	5.348	6.00
5.310	3.510	1.250	2.260	3.390	4.520	5.650	5.82
5.460	3.560	1.311	2.249	3.374	4.498	5.623	6.18
5.510	3.610	1.280	2.330	3.495	4.660	5.825	6.17
5.660	3.660	1.372	2.288	3.432	4.576	5.720	6.71
5.720	3.710	1.311	2.399	3.599	4.798	5.998	6.51
5.870	3.760	1.402	2.358	3.537	4.716	5.895	7.08
5.940	3.810	1.341	2.469	3.704	4.938	6.173	6.88
5.990	3.860	1.311	2.549	3.824	5.098	6.373	6.84
6.070	3.910	1.250	2.660	3.990	5.320	6.650	6.63
6.220	3.960	1.341	2.619	3.929	5.238	6.548	7.21
6.270	4.010	1.311	2.699	4.049	5.398	6.748	7.17

SPAN	RISE	X (m)	V (m)	H (m) FOR BEVELS:			AREA "A" (m <sup>2</sup> )
				1.5: 1	2: 1	2.5: 1	
CSPA 75 x 25 CORRUGATIONS (SEE NOTE ☒)							
1010	790	0.330	0.460	0.690	0.920	~	0.29
1160	920	0.395	0.525	0.788	1.050	~	0.40
1340	1050	0.385	0.665	0.998	1.330	~	0.38
1520	1170	0.520	0.650	0.975	1.300	~	0.65
1670	1300	0.580	0.720	1.080	1.440	~	0.80
1850	1400	0.640	0.760	1.140	1.520	~	0.99
2050	1500	0.605	0.895	1.343	1.790	~	1.03
2200	1620	0.655	0.965	1.448	1.930	~	1.22
2400	1720	0.705	1.015	1.523	2.030	~	1.42
2600	1820	0.755	1.065	1.598	2.130	~	1.65
2840	1920	0.805	1.115	1.673	2.230	~	1.88
2970	2020	0.855	1.165	1.748	2.330	~	2.14
3240	2120	0.905	1.215	1.823	2.430	~	2.40
3470	2220	0.955	1.265	1.898	2.530	~	2.69
3600	2320	1.005	1.315	1.973	2.630	~	2.99
CSPA 68 x 13 CORRUGATIONS (SEE NOTE ☒)							
1440	970	0.330	0.640	0.960	1.280	~	0.41
1620	1100	0.370	0.730	1.095	1.460	~	0.52
1800	1200	0.415	0.785	1.178	1.570	~	0.64
1950	1320	0.455	0.865	1.298	1.730	~	0.76
2100	1450	0.495	0.955	1.433	1.910	~	0.89

NOTES:

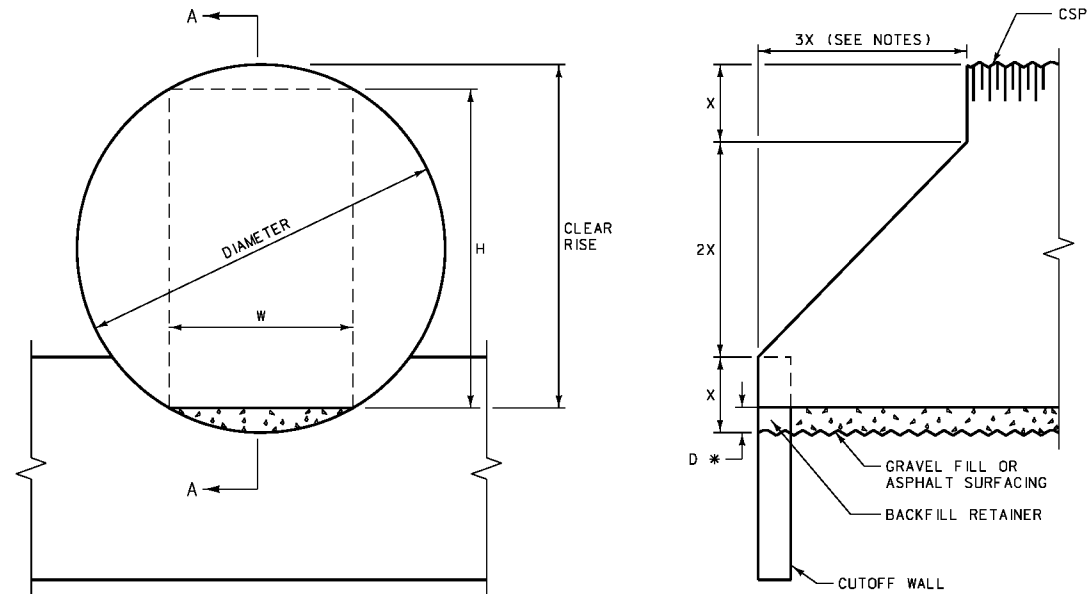
BEVEL TO TOP OF CORNER PLATE.

PIPE ENDS ARE SQUARE (PERPENDICULAR  
TO CENTERLINE OF PIPE) AND FILL SLOPES  
ARE WARPED TO ACCOMMODATE THE SQUARE  
ENDS UNLESS SPECIFIED OTHERWISE ON  
PLANS.

☒ TABULATED VALUES BASED ON NOMINAL PIPE  
DIMENSIONS. IN PLACE DIMENSIONS SUBJECT  
TO TOLERANCES LISTED IN CURRENT AASHTO  
M 36M AND M 196M.

ALL DIMENSIONS ARE MILLIMETERS  
(mm) UNLESS OTHERWISE NOTED.

DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 603	DWG. NO. 603-34
BEVEL ON ARCH METAL CULVERT	
EFFECTIVE: AUGUST 1999	



SECTION A-A

DIAMETER	X (m)	* D	CLEAR RISE (m)	H (m)	W (m)	BACKFILL RETAINER (m³)
2100	0.525	168	1.944	1.789	1.1	0.03
2250	0.563	257	2.006	1.761	1.4	0.05
2400	0.600	276	2.137	1.873	1.5	0.06

SURFACING QUANTITIES PER METER FOR DEPTH "D" *					
DIAMETER	FULL DEPTH GRAVEL	60 mm PMS AND REMAINING DEPTH GRAVEL			
	m³ SURF.	TONS SURF.	m³ SURF.	TONS BIT. MATERIAL	PRIME
2100	0.131	0.144	0.068	0.0086	0.0013
2250	0.253	0.188	0.171	0.0113	0.0018
2400	0.291	0.201	0.203	0.0121	0.0020

NOTES:

UNLESS OTHERWISE SPECIFIED, INSTALL STOCKPASSES WITH CUTOFF WALLS AND BACKFILL RETAINERS AT EACH END, GRAVEL FILL AND BEDDING MATERIAL.

WHEN SPECIFIED, INSTALL COMBINATION STOCKPASSES AND DRAINS WITH CUTOFF WALLS, BACKFILL RETAINERS AT BOTH ENDS, CONCRETE EDGE PROTECTION AT THE INLET END, RANDOM RIPRAP AT THE OUTLET END, BEDDING MATERIAL AND ASPHALT SURFACING; CROSS SLOPE ASPHALT SURFACING TO ALLOW DRAINAGE COURSE ALONG ONE SIDE. (SEE DTL. DWG. NO. 613-14 AND 613-06.)

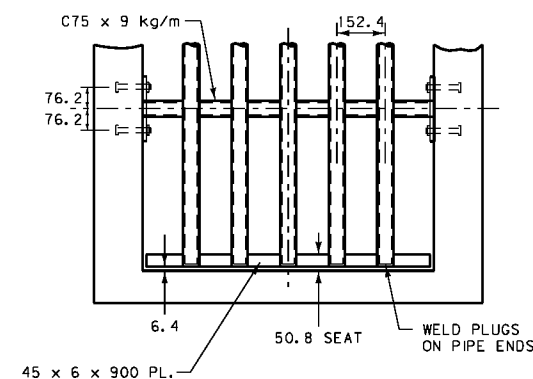
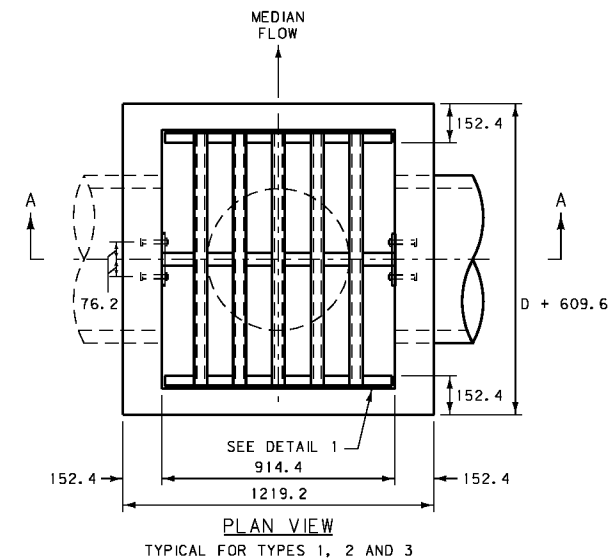
UNLESS OTHERWISE SPECIFIED, STEP BEVEL PIPE ENDS AT A 1.5:1 SLOPE.

SEE FILL HEIGHT TABLES FOR THICKNESS REQUIREMENTS.

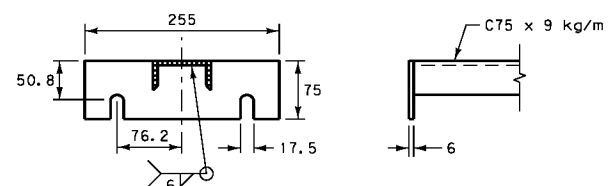
SEE DTL. DWG. NO. 552-00, 603-30 AND 603-18.

ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	603-36
SECTION 603	
CORRUGATED STEEL PIPE STOCKPASS	
EFFECTIVE: AUGUST 1999	



DETAIL 1



DETAIL 2

GRATE AND REINFORCING STEEL (kg) *			
TYPE	CMP AND RCP		
	600 mm	750 mm	900 mm
1	22.7	~	~
2	38.6	43.1	47.6
3	38.6	43.1	47.6
GRATE	74.8	83.9	95.3

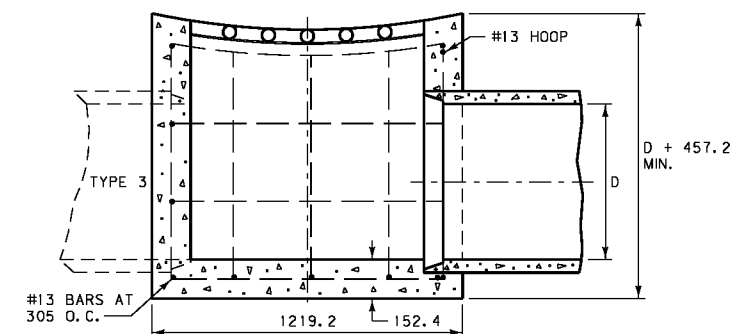
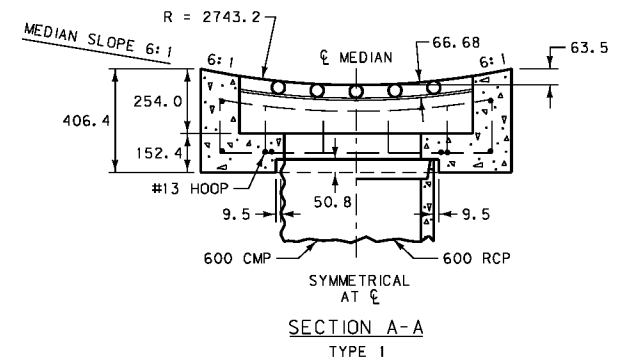
\* QUANTITIES ARE FOR ESTIMATING PURPOSES ONLY.

⊗ TYPE 3 IS A SPECIAL CASE TO BE FIGURED FOR THE PARTICULAR INSTALLATION.

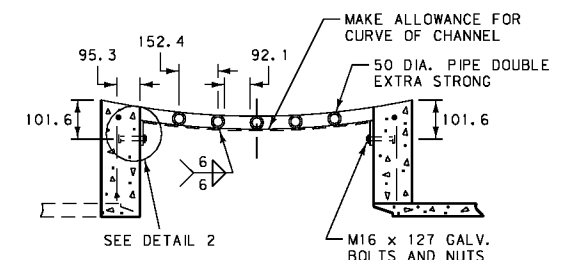
NOTE:

PAINT ALL EXPOSED METAL PARTS WITH ONE COAT OF ZINC RICH PAINT AND TWO COATS OF ALUMINUM PAINT IN ACCORDANCE WITH SECTION 710 OF THE STANDARD SPECIFICATIONS.

NOTE:  
WHEN MEDIAN INLET COVER IS INSTALLED OVER PIPES LARGER THAN 900 mm, WITHOUT ADEQUATE COVER TO PERMIT THE USE OF TYPE 1 INSTALLATION, PROVIDE A DETAIL OF THE INSTALLATION IN THE PLANS.



SECTION A-A  
TYPE 2 HAS 1 PIPE CONNECTION  
TYPE 3 HAS 2 PIPE CONNECTIONS



COVER DETAIL  
TYPES 2 & 3

CLASS "DD" CONC. OR EQUAL (CUBIC METERS) *					
TYPE	600 mm		750 mm		900 mm
	CMP	RCP	CMP	RCP	CMP
1	0.31	0.31	~	~	~
2	0.76	0.76	0.84	0.76	0.92
3	0.69	0.69	0.76	0.69	0.76

ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	604-00
SECTION 604	
MEDIAN INLET COVER	
EFFECTIVE: AUGUST 1999	